# Welcome to 122

You're halfway through a roughly 20 week sequence that will bring many of you from writing some of your first lines of code to building a data-driven visualization from scratch.

Not here as gatekeeper, here to welcome new civic hackers to the fold and level you up.

This *is* a tough course. I want you to leave here a way better programmer than you are now, and we can do it.

# James Turk

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- Joined the university last year.
- Got my start in Civic Tech while I was in college in 2006.
- I am here because of CAPP.
- I am probably here in part because of this class. (scraping, jellyfish, etc.)

## Communities

Python

Django

Civic Hacking

IndieWeb

## Jobs

Sunlight Foundation

PBS

Open States

Princeton Gerrymandering Project

Plural fka Civic Eagle

Data Journalism Freelance

I didn't come here via a traditional path.

Neither did a lot of you.

I've led a lot of teams, and worked with a lot of junior devs, some that came through this program or others like it.

# Goals

# Real-world experience

Program structure, finding & evaluating tools and data, working on a team.

Put you on a path towards mastery of your everyday tools.

# Understand Data

Representation, collection, cleaning, visualization, ...

Applying your skills to real problems.

# Data Structures and Algorithms

Hashtables, graphs, trees, record linkage, ...

Help prepare you for MPCS courses.

# What We're Here To Do

## Make things better, with code as a tool.

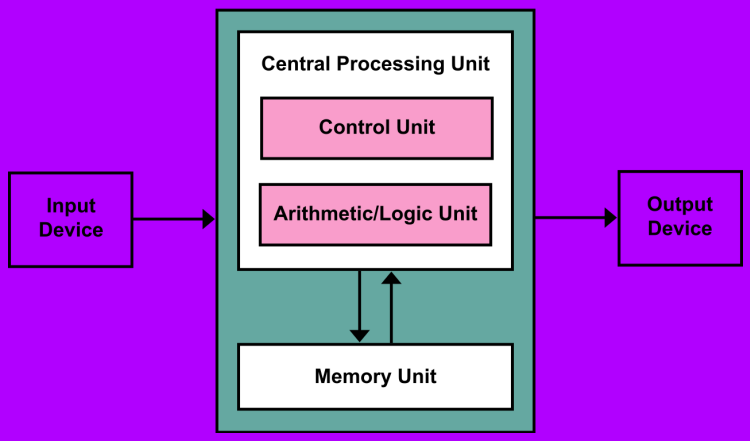
Throughout it all, we will keep our overall goal in mind.

"Changing the world, bit by bit." – but what are those bits?

This is the class where we are going to really start connecting your code to the real world. An exciting transformation in your ability to create change.

# This course is...

## Fundamentally About `data`




Von Neumann architecture, foundation of modern computing.

Data-centric. Everything (including programs!) are data.

If this course jumps all over the place, how do we keep it from feeling too disjoint?

We are exploring branches off of `data`.

# This course is...
# Less Linear

This course is different from 121. I think it's worth taking a few minutes to talk about how so.

# Topics

- Inheritance
- Python Ecosystem
- Web Scraping
- APIs
- Databases*
- Record Linkage
- Visualization
- Shell Scripting
- Decision Trees*
- Data Structures

This course is going to jump from topic to topic more.

Some people love it, if you don't really get a topic in Week 2 there's a good chance you won't see it again. For better or for worse. That means you might want to revisit some things on your own, I'll try to point towards additional resources wherever I can. In my experience it sometimes takes a couple of different explanations for a topic to click.

That said, please ask questions. This course is a lot better if it isn't me talking at you all for 160 minutes every week.

# This course is...

# More Code

# More Code

## 5 Programming Assignments
## 1 Group Project
## Optional Exercises

When I say more code, I don't know if it is strictly speaking more lines of code, though I imagine it is.

What I mean is that the problem sets expect a lot more of you.

In 121 you were learning a new language as well as a new way to think about problems. You are now more or less capable of reading and writing that language, and so now we'll lean in more on computational thinking. You are going to get larger problems and be expected to be able to break them down into smaller components.

There's a big leap here, but I've seen every current second year take it and succeed and you all will too.

# Grading

## Code review is how junior programmers improve.

At this point, you've heard "skills not scores" plenty of times, but let's talk about it again.

My philosophy for this course is that we need to provide enough feedback to help you improve, so I've designed the grading system around that. It is geared at providing granular feedback on areas of your assignments with ESNU grades to give you a sense of how you are performing on those particular skills compared to our expectations.

# Course Support

## 6 TAs

JP Martinez

Jack Gibson

Katherine Dumais

Reza Rizky Pratama

Summer Long

TBD

## Office Hours M-F

## Ed Discussion

## Harris Tutoring

## Make An Appointment w/ Me

Now's probably a good time to talk about what kind of support we have for you in this course.

First of all, we have an exceptional set of TAs.

These are all phenomenal people. They are a huge part of this course. One will be assigned to your project team, and they're going to be around to help with your assignments.

Be good to them.

Between the seven of us we have nearly 20 office hours a week. **Please use them!**

We will also be monitoring Ed Discussion. It is great for a course like this. The main rule to remember is to not post code directly there. With that in mind, it's a great place to get help.

Then of course we also have the Harris tutors, more excellent people to help over there.

And last but not least, make an appointment with me. The link is on the course site, and I am glad to do it.

# Grading

## Completion

Does your code work?

S: Yes

N: With some issues

U: No

## Design

Were you thoughtful in your approach?

E: Incredibly

S: Yes

N: With some issues

U: No

## Style

Did you follow style guidelines?

S: Yes, mostly.

N: Mostly, with some clarity issues.

U: Repeated/significant deviations.

# Project

## Teams of 3-4

## Week 3: Proposals Due

## Week 7: Check-In

## Week 10: Project Fair

# Requirements

## 2+ sources of data

One scraped or via API.

## Data Analysis Component

Must have a predictive model, simulation, or (non-exploratory) visualization. **What is your data saying?**

## Visual Output

Data Visualization or other creative output.

# Final Grade

E = 2

S = 1

N = 0.5

20 PA points (up to 4 points per PA)

+3 optional points

23 possible points

# Final Grade

| Points | Project: E | S+ | S | S- | N |
|---|---|---|---|---|---|
| >=19 | A | A | A- | B+ | B |
| >=17 | A | A- | B+ | B | B- |
| >=15 | A- | B+ | B | B- | C+ |
| >=13 | B+ | B | B- | C+ | C |
| >=10 | B- | C+ | C | C- | D+ |

https://people.cs.uchicago.edu/~jturk/capp30122/grading/

# Course Policies

## Academic Honesty
## Accessibility
## Staff Code of Conduct
## Health
## Diversity
## Generative AI

I want to briefly touch on a few things about the course policies.

All of these are linked in the nav menu on the course site.

Please treat everyone with respect, your peers, and course staff.

Part of that respect should include only turning in work that is your own. What I mean by that is that if there is a line of code in a submission that means you wrote it. Not a friend, Stack Overflow answer, or AI.

We have an explicit generative AI policy that makes this clear. At this phase in learning, generative AI is mostly something I'd avoid. It will write code with subtle bugs that you'll struggle to fix, and most importantly will deprive you from learning to reason about a problem.

It is those reasoning skills we're here to hone.

# This course is... challenging and rewarding.

We're heading into 10 cold dark weeks together in this basement. Let's have one another's back.

Honestly, let's have some fun with it. I will keep the course as entertaining and relevant as I can, and in turn I need you all to participate. Be here, be present, ask questions, use Ed, come to office hours. Let me know how things are going.

And let's not forget why we're here, and try to have some fun with it while we're at it.